

- 1 In the claims:
- 2 1. A method of depositing solder, the method comprising the steps of:
- 3 providing a substrate that includes a substantially planar surface and a
- 4 sloped surface adjacent to the substantially planar surface;
- 5 forming a wettable layer on a portion of the sloped surface; and
- 6 forming a solder layer on a first portion of the wettable layer.
- 7 2. The method of claim 1, wherein the providing step comprises the step of:
- 8 etching the substrate to form the sloped surface.
- 9 3. The method of claim 2, wherein the providing step further comprises the step of:
- 10 anisotropically etching completely through the substrate to form the sloped
- 11 surface.
- 12 4. The method of claim 1, wherein the step of forming the wettable layer comprises
- 13 the step of:
- 14 depositing a metal layer as the wettable layer.
- 15 5. The method of claim 1, further comprising the step of:
- 16 adhering, prior to the step of forming the solder layer, an organic film to
- 17 the substantially planar surface of the substrate.
- 18 6. The method of claim 5, wherein the adhering step substantially prevents the
- 19 organic film from adhering to the sloped surface of the substrate.
- 20 7. The method of claim 5, further comprising the step of:
- 21 removing, prior to the step of forming the solder layer, a portion of the
- 22 organic film adjacent to the wettable layer, forming a gap between the organic
- 23 film and the wettable layer on the sloped surface of the substrate.
- 24 8. The method of claim 7, wherein the step of forming the solder layer comprises the
- 25 step of:
- 26 substantially filling the volume of the portion of the organic film that was
- 27 removed from the organic film with solder paste.
- 28 9. The method of claim 8, wherein the forming the solder layer step further
- 29 comprises heating the solder paste to about 180°C or less.
- 30 10. The method of claim 5, wherein the adhering step further comprises adhering the
- 31 organic film to a substantially planar portion of the wettable layer on the
- 32 substantially planar surface of the substrate.
- 33 11. The method of claim 1, further comprising the step of:

- 1                   forming a coating layer on the wettable layer prior to the formation of the  
2           solder layer,  
3                   wherein the coating layer prevents the formation of the solder layer on the  
4           surface of the wettable layer occupied by the coating layer.
- 5   12.   The method of claim 11, wherein the coating layer is a non-wettable layer.
- 6   13.   A semiconductor device comprising:  
7                   a substrate having a substantially planar surface and an interior sloped  
8           surface;  
9                   a wettable layer adhered to a portion of the interior sloped surface; and  
10                  a solder layer adhered to a first portion of the wettable layer.
- 11   14.   The semiconductor device of claim 13, wherein the wettable layer comprises a  
12           metal.
- 13   15.   The semiconductor device of claim 13, further comprising a coating layer adhered  
14           to a second portion of the wettable layer.
- 15   16.   The semiconductor device of claim 15, wherein the coating layer is a non-wettable  
16           layer.
- 17   17.   The semiconductor device of claim 16, wherein the coating layer comprises a  
18           dielectric material.
- 19   18.   The semiconductor device of claim 13, wherein the solder layer comprises a tin-  
20           bismuth compound.
- 21   19.   The semiconductor device of claim 13, wherein the solder layer comprises a  
22           eutectic tin-lead compound.
- 23   20.   The semiconductor device of claim 13, further comprising a rigid organic film  
24           adhered to a portion of the substantially planar surface of the substrate and  
25           adjacent to a portion of the sloped surface.
- 26   21.   A method of depositing solder, the method comprising the steps of:  
27                   providing a semiconductor substrate that includes a substantially planar  
28           surface and a sloped surface that has been etched into the semiconductor substrate,  
29           adjacent to the substantially planar surface;  
30                   forming a wettable layer on a portion of the sloped surface; and  
31                   forming a solder layer on the wettable layer.
- 32
- 33   22.   The method of claim 21, wherein the step of forming the wettable layer comprises  
34           the step of:

1                    depositing a metal layer as the wettable layer.

2    23.    The method of claim 21, further comprising the step of:

3                    adhering, prior to the step of forming the solder layer, an organic film to

4                    the substantially planar surface of the semiconductor substrate.

5    24.    The method of claim 23, further comprising the step of:

6                    removing, prior to the step of forming the solder layer, a portion of the

7                    organic film adjacent to the wettable layer, forming a gap between the organic

8                    film and the wettable layer on the sloped surface of the semiconductor substrate.

9    25.    The method of claim 24, wherein the step of forming the solder layer comprises

10    the step of:

11                    substantially filling the volume of the portion of the organic film that was

12                    removed from the organic film with solder paste and heating the solder paste.

13    26.    The method of claim 23, wherein the adhering step further comprises adhering the

14                    organic film to a substantially planar portion of the wettable layer on the

15                    substantially planar surface of the semiconductor substrate.

16    27.    The method of claim 21, further comprising the step of:

17                    forming a coating layer on the wettable layer prior to the formation of the

18                    solder layer,

19                    wherein the coating layer prevents the formation of the solder layer on the

20                    surface of the wettable layer occupied by the coating layer.

21    28.    The method of claim 27, wherein the coating layer is a non-wettable layer.